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Assessment of caesarean-section delivery and associated Factors: The case of two hospitals in Addis Ababa

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List of Acronyms and abbreviations

ACIPH Addis Continental Institute of Public Health

AOR Adjusted Odds Ratio

COR/OR Crude Odds Ratio/Odds Ratio

ARHB Addis Ababa Regional Health Bureau

BMCH Brass Maternity and Children Hospital

BMI Body Mass Index

CS Caesarean Section

DHS Demographic and Health Survey

EDHS Ethiopian Demographic and Health Survey

EDD Expected Date of delivery

GMH Gandhi Metasebia Hospital

ICU Intensive Care Unit

MDG Millennium Development Goal

WHO World Health Organization

VBAC Vaginal Birth after Caesarean

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Abstract

Problem statement: - Caesarean delivery is showing an increasing trend worldwide and is registered above the WHO recommendation. Caesarean delivery has associated risk of maternal morbidity and mortality than vaginal delivery. In Ethiopia, particularly in A.A, the trend of caesarean delivery is increasing. However, less attention is paid by researchers. Therefore, this study focuses on assessing the proportion of caesarean delivery and factors associated to it among mothers who delivered in two selected hospitals of A.A.

Objective:-The main objective of this study is to assess the prevalence of caesarean delivery among mothers delivered in two selected hospitals and factors associated to caesarean.

Methods: - The study design is a cross sectional study with internal comparison .Sample of 414 women/305 from Gandhi and 109 from Brass/ were included in the study. To estimate the proportion of caesarean delivery by demographic, socio economic and obstetric difference, descriptive analysis was done and to see the association with the independent variables, Bivariate and Multivariate analysis was done.

Results:-Over all CS delivery is high in both hospitals (i.e. 32%). CS delivery in Gandhi hospital (public hospital) was 26% where as higher in Brass from the private hospital i.e. 46%. Type of Hospital and Pregnancy health problem has significantly associated with CS delivery with AOR of 0.5(0.32, 0.85) and 1.78(1.1, 2.8) respectively. 18% Deliveries was without medical indication (As the mother's response).

Conclusion and recommendation: - the current Proportion of caesarean delivery in the city of A.A is high and thus the rate has gone beyond the WHO recommendation. To ensure caesarean delivery is within the medical indication, all caesarean deliveries should be monitor whether it is recommended according to the medical indication or not and the mothers should be informed why caesarean delivery is recommended for their case.

1. Introduction

Background

Maternal health is one of the MDG goals that are expected to be achieved by 2015.every country; especially the developing countries are doing many efforts towards the achievement of ¾ reduction of maternal death by the end 2015(1, 2).

Interventions focused on reduction of maternal mortality are focused in three areas consecutively. These are Reduction of the likelihood that a woman will become pregnant, reduction of the likelihood that a pregnant woman will experience a serious complication of pregnancy on childbirth and reduction of the likelihood of death among women who experience complication (3).

Cesarean delivery is one of the options to deal with complicated childbirth and when normal process of labor is failed. Many mothers and infants have been saved from death and disability by performing caesarean delivery of complication cases of childbirth(3) .

Although cesarean section deliveries can be lifesaving for both mothers and their infants when medically indicated, their overuse is cause for concern due to their association with increased maternal morbidity and mortality, cost, and utilization of scarce health system resources compare to vaginal delivery (4).

A trend of cesarean-section delivery is increasing worldwide(5). In addition, a significant proportion of these surgical interventions are being performed without there being a clear medical indication (6).

Most cesarean deliveries took place because of or in association with obstetrical complications or medical illness. However, rates of elective primary cesarean deliveries with no clear medical or

obstetrical indication are rising dramatically. The rates vary widely by country, health care facility and delivering physician, partly because of differing perceptions by health care providers as well as by pregnant women of its benefits and risks (5)

In Ethiopia according DHS 2011, over all caesarean delivery is around 1-2% with a wide regional variability which is from low of 0.5 % in Oromiya to a high of 21.8% in Addis Ababa(7).

Different researches explain that the rise in caesarean delivery is due to different factors such as Type of hospital, medical indication, age, weight, BMI, socioeconomic status and preference of pregnant women.

Statement of the problem

Despite WHO recommendations that population based cesarean section rates not exceed 15%, Many countries have rates two to three folds of that threshold. Delivery by caesarean section may have associated with additional risk of maternal morbidity and mortality independently. Women who Delivered by elective (i.e. without medical indication) or intrapartum caesarean section were found to be at greater risk of death or of developing a severe complication requiring admission to the intensive care unit, hysterectomy and hemorrhage than women who delivered vaginally(6).

Justification

Since caesarean delivery is prevalent from time to time, identifying factors that contribute to this increment is fundamental in order to monitor closely and reducing unnecessary caesarean deliveries.

Addis Ababa is one of the highest prevalent with caesarean delivery in the country. Exploring risk factors of caesarean delivery has a contribution for the successful implementation of

maternal health service utilization in the country. The research tends to assess the prevalence of caesarean delivery among mothers who delivered in two selected hospitals (in one private and one public hospital) and factors contributing to Caesarean-Section delivery.

Hypothesis:

Mode of delivery depends on Type of Hospitals/Private Vs Public/.

2. Literature Review

Type of Delivery:

Childbirth is the termination of a pregnancy or gestation period with the birth of one or more Fetus from a woman's uterus through Vagina birth or Caesarean section. Where as a normal birth is a biological process defined as spontaneous onset, low-risk at the start of labor and remaining so throughout labor and delivery of fetus in the vertex position between 37 and 42 completed weeks of pregnancy through Vagina. After birth, mother and infant are in good condition(8). Caesarean section is delivery of fetus through small incision in the lower abdomen. Caesarean-Section Delivery is recommended where vaginal delivery is not possible and risky for the health of the mother's or fetus. Therefore the indication for caesarean delivery categorized as : fetal indication i.e. nonreasuring fetal heart tracing, non vertex or breech presentation, conjoined twins, fetal anomalies such as hydrocephalus that would make successful vaginal delivery unlikely and from the maternal indication i.e. obstruction of the lower genital tract (e.g. large condyloma), abdominal cerclage, active maternal Herpes Simplex Virus infection, previous caesarean section(if not an appropriate candidate for VBAC or VBAC is declined by the patient), Previous uterine surgery involving the contractile portion of the uterus (classical cesarean, myomectomy), placenta previa, abruption placenta, and labor dystocia or cephalopelvic disproportion(9).

Prevalence of caesarean delivery:

In most developed and some developing countries, cesarean delivery rates are increasing from time to time. As 2004-2005 world health organization global survey on maternal and

prenatal health shows, one in three women deliveries by caesarean section (5). In addition, according a cross-sectional study conducted in southern Brazil in the city of Rio Grande,

Caesarean section was 51.6 % for the year of 2007(10). The rate of primary caesareans in New South Wales increased from 11.9 per 100 births in 1998 to 17.8 per 100 births in 2008(11). Trends of caesarean delivery over 10 years period have been assessed in Nigeria, caesarean delivery rise from 3.8% in 1990 to 20.7% in 1999(12). Despite it is low caesarean delivery in rural Ethiopia, which is, less than 1%, there is a great increase rate of caesarean delivery in urban areas, which is highest in Addis Ababa with 21.8% (7, 13).

Associated Factors of Cesarean Section delivery:

Socio economic and demographic factors such as education, income, age and weight are associated with caesarean delivery. Caesarean sections are more common among wealthy and educated women than poor and less educated , those with more antenatal attendance, primiparous women and in contradiction those with a lower gestational risk in Brazil(14) . And from this study of the ethnographic result ,Before arriving at the hospital 40% of women said they expected to have a caesarean section because vaginal birth was considered as risky and negative experience, whereas caesarean sections represented the best quality care(14) . Age of pregnant women contribute to the rise of caesarean delivery .In Taiwan Women who had cesarean deliveries with medical indications were older than women who had cesarean deliveries Without medical indications(15) . Maternal age and paternal occupation were positively significantly associated with a higher cesarean section rate in Beirut (16). The risk of cesarean delivery in Scotland increases by odds 1.51 times for a 5 year increase in age starting from age of 16 years. that is the cesarean delivery rate among nulliparous women was more than doubled and the proportion of women aged 30–34 years increased 3-fold, the proportion aged 35–39 years

increased 7-fold, and the proportion aged above 40 years increased 10-fold. Obese women are at higher risk of giving birth by caesarean(17). a secondary analysis of 841 pregnant women enrolled in a Prospective, randomized, controlled trial in Yale University, which is the rate of caesarean delivery among obese women is 24.3 where as 16.9 among normal gainers and 13.3 among under gainers. The odds of cesarean delivery for obese women were 2.3 times more likely than for normal weight women(18).

Preference of pregnant women to give birth by caesarean also differs by socio economic status. Study of consumer demand for cesarean section in Brazil shows, richer women has more demand for caesarean delivery than poor women (14). According to the EDHS of 2005, caesarean delivery differs by women's wealth quintile. Which is 0.3% among poorer women while 5.3% among the richest women(7) .

Obstetric factors such as parity, hypertensive disorders of pregnancy and labor and delivery complication are risk factors for medical indication of cesarean section (11). Malpresentation, prior cesarean section, and dysfunctional labor together accounted for 82.6% of cesarean section with medical indications in Taiwanese women(15) . Previous study in three hospitals of Greek shows Fetal birth weight >4000gram and Gestational age longer than 36 weeks predict caesarean delivery (19).

There is a higher cesarean delivery in Private hospital than public hospital(6) . And Women delivering in private hospitals were more likely to have an elective caesarean delivery. research conducted in three hospitals of Greek, those mothers with private insurance have 7.73 times more likely to undergo caesarean delivery than those who paid directly (19).Women who were single, young and less educated were more likely to deliver vaginally (6). In southern brazil in the city of Rio Grande, the cesarean section rate was 51.6% while 42.6% among public users and

85.8% among private users(10). Among residents in urban area of South Europe the odds of likelihood of delivering by Cesarean was 2.3 times higher in private than in public hospitals (20)

Adverse outcomes of Cesarean delivery:

Women delivered by Cesarean have higher risk of morbidity than women who delivered by vaginal delivery. Major morbidities include hemorrhage, uterine rupture. Hysterectomy, cardiac arrest, venous thrombo embolism and infection (6, 21, 22). In Canada Severe maternal morbidity rate was 2.7 % for women in the planned cesarean delivery group where as 0.9% among those in the planned vaginal delivery group (5).

The prevalence of severe maternal outcomes in the 2004-2008 WHO Global Survey on Maternal and Prenatal Health was 37 cases/1,000 deliveries. Compared to spontaneous vaginal delivery, all other modes of delivery presented an association with increased risk of death, admission to ICU, blood transfusion and hysterectomy, including ante partum caesarean section without medical indications by odds of 5.93 and intrapartum caesarean section without medical indications by odds of 14.29 (13,22). Study conducted in Washington shows, Women to have uterine rupture were more likely with spontaneous onset of labor than women who did not undergo labor with prior caesarean delivery (relative risk, 3.3).Uterine rupture occurred at a rate of 1.6 per 1000 among women with repeated cesarean delivery without labor, 5.2 per 1000 among women with spontaneous onset of labor, 7.7 per 1000 among women whose labor was induced without prostaglandins and 24.5 per 1000 among women with prostaglandin-induced labor (23). Overall, the incidence rate for severe maternal outcomes associated with caesarean section without medical indications was about three times greater than that associated with spontaneous vaginal delivery (24). Caesarean section was 14 times higher than spontaneous vaginal delivery, when performed without medical indication after the onset of labor (24). And

these adverse out comes associated with caesarean section with and without medical indication were seen more in the data from Africa facilities compared with facilities in Asia and Latin America (24).

Even though few studies in Ethiopia shows the prevalence and some factors of caesarean delivery such as urban, rural residence and income difference, it is not enough to conclude with this studies and further studies relating to other factors is important. Therefore, this study intends to assess the prevalence and Risk factors of caesarean delivery in one public and one private hospital in Addis Ababa city administration.

3. Objective

General objective:

To assess Proportion of cesarean-section delivery and associated factors among mothers giving birth in one private and one public hospital of Addis Ababa.

Specific objectives:

1. To assess the Proportion of cesarean-section in one private and one public hospitals of Addis Ababa.
2. To assess factors associated with cesarean-section delivery in one private and one public hospital of Addis Ababa.

4. Methods

Study Area:

The study was conducted in Gandhi Metasebia hospital and Brass Maternal and child health hospital from January to March 2012. Gandhi hospital is one of the public hospital located in Addis Ababa city administration which mainly working on Delivery service with a monthly Average of 300 mothers attended delivery services and Brass is one of among the private maternal and child health Hospital in Addis Ababa city Administration with an average of 60 mothers delivered on monthly basis.

Study design:

This study design is a cross- sectional with internal comparison and quantitative data was used to address the issues mentioned in the study objective.

The data collection was conducted from January 9, 2012 to February 8, 2012 and from January 9, 2012 to March 5, 2012 in Gandhi and Brass respectively.

Study population:

Study population is women who delivered in Gandhi and Brass hospital of Addis Ababa.

The Actual Study Population is women who delivered in Gandhi and Brass hospital form the January to March 2012.

Inclusion criteria

All women who attended delivery services in these selected hospitals during the data collection period.

Sample Size determination:

5. Sample size for Objective 1: To assess the Proportion of cesarean-section delivery in selected hospitals of Addis Ababa.

The sample size for this purpose is:

The prevalence of caesarean delivery in Addis Ababa as EDHS 2005 is 16% a single population proportion formula was used.

Then the formula for sample calculation is:

$$N = Z\frac{\alpha 2}{2}\frac{P(1-P)}{d^2}$$ Where $Z\frac{\alpha}{2}$ is 1.96 with 95% confidence, d is 4% and P is 0.16

$$= (1.96)^2\frac{0.16(0.84)}{(0.04)^2}$$

N=**322**

6. Sample size for objective 2:

Assumptions Undertaken for this sample size is:

Variables considered in the calculation of the sample size:

Power of the study is (1-β) = 80%, 0.84

Confidence interval of 95%, Zα/2 is 1.96

Ratio of Exposed to Unexposed = 1:1

Therefore the formula is two population proportions:

$$N_1 = \frac{\left[\frac{Z\alpha}{2}\sqrt{(1+1/r)P(1-P)} + Z\beta\sqrt{P_{1(1-P_1)} + \frac{P_{2(1-P_2)}}{r}}\right]^2}{(P_{1-P_2})2}$$

Accordingly the sample size for each variables calculated is in the table below

Variables	P1 Exposed	P2 Unexposed	Ratio of Expose To Unexposed	OR	Sample size For Exposed	Sample Size For Unexposed	Total Sample size
Medical Indication	0.83	0.17	1:1	2	207	207	414
Type of hospital /private Vs public/	0.86	0.43	1:1	2	144	144	288

Therefore the total number of respondents considered to assess the stated objectives was taken the maximum sample size calculated. i.e. = 414.

Considering the monthly delivery in each hospital, Ratio of participants from Brass to Gandhi was taken 1:2.8 .i.e 109 from Brass and 305 from Gandhi was included in the study.

Sampling Procedure:

All Hospitals that provide delivery services was considered as clusters and be categorized as private and public hospitals. Then a purposive selection of two hospitals, one from public and one from private were included in the study. Purposive selection was used to address those hospitals that provide major services related delivery, according to the type of hospital (Public Vs private) and their consent of the Hospitals for this study. 414 birth attendants under the two Hospitals were interviewed.

Data collection Procedure:

Data source: Primary data was collected through interview from mothers attended delivery in Gandhi and Brass hospital in the period of January to March 2012.

Data collection tool: structured questionnaire was Prepared in English and translate to Amharic Version. The Amharic Version was used to collect the data. The questionnaire was categorizes in three parts included Demographic Information, Socio economic information and Obstetric information.

Enumerators: Two female public health professionals were used to collect the data. The data was collected through face-to-face interview .one enumerator in each hospital was used.

Time of data collection: Birth attendants who were in postnatal care/before leaving the hospital/ were interviewed on daily basis until fulfill the intended sample size. It was taken estimated one month and two month period in Gandhi and Brass respectively.

Variables to be considered in the model:

Dependent variable: Mode of delivery/vaginal delivery Vs caesarean delivery/

Independent variables: Medical Indication /X1/and Type of Hospital (Private Vs Public) / X2/, Maternal age /X3/Education level/X4/, income level/X5/, parity/X6/, gestational age/X7/ and BMI/X8/.

Data quality:

The data collectors was trained for one day before starting data collection and supervised daily by the researcher at the hospital during data collection. And a one day pretest was conducted in Zewditu hospital. The questionnaire was edited and printed accordingly. The collected data was reviewed at the end of each day and feedbacks were provided on timely basis for any missing or invalid data records.

Data Management and analysis:

The filled Questionnaires were collected every day and were entered to EPinfo. And data cleaning and editing was carried out both before and after data entry Using EPinfo version 3.5.1and with SPSS after transfer to SPSS. Descriptive and logistic regression analysis was done using SPSS version14.

Data analysis:

The data analysis was performed using the Statistical Package for the Social Sciences (SPSS) for Windows version 14.0. Descriptive analyses performed including frequencies, percentages, means and standard deviations and Analytic analysis including Bivariate and multivariate analysis was performed. Results were produced based on the variables of interest.

Definition of Operational Terms:

Medical Indication: is the indication to perform caesarean section delivery due to fetal and maternal factors which makes vaginal delivery impossible.

Ethical Consideration:

The study has received ethical clearance from Addis Continental Institute of Public Health (ACIPH) and Addis Ababa Regional Health Bureau (ARHB).

Oral and written Consent from the hospital owners was obtained. Informed consent was received from women interviewed in this study according to their willingness to participate in the study. Information about the study objectives was given to the participant .ensuring them this is a voluntary participation, they can withdraw the interview at any time, and they are not forced to answer without their will. The data collected individual women was kept confidentially by using code instead of name to identify individuals and it was not manipulated by the researcher his or her interest. The data was used only for this research and individual information was not disclosed to third parties.

Dissemination of data:

The research will be disseminated to the respective body by hard copy and through electronically.

5. Results

417 mothers who delivered in the two hospitals was invited to participate in this research, and Information was collected from a total of 414 mothers delivered in both hospitals (Brass and Gandhi hospital) i.e. 99.3% response rate. Two mothers from Gandhi hospitals were not interviewed due to language barrier while one mother from brass refused to participate in the research.

In Table 1 below the socio-demographic and obstetric characteristics of mother's shown. A total of 109(26.3%) and 305(73.7%) women were interviewed from Brass and Gandhi hospital respectively. The mean age of the mothers interviewed is 27.2years with standard deviation of 4.71. The age range of mothers shows that 271 (66%) of them lie between the ages 20-29 years. As reported by the mother, 195(47%) of Pre pregnancy weight and 238 (57.5%) of the term weight mothers were between 50-69kg. whereas 113(27%) and 45(11%) mothers didn't know their pre pregnancy weight and term weight respectively.

More than half of mothers 227(54.8%) didn't know their height and 156(37.7%) mothers are between the height of 150-169cm. almost all 386(93%) mothers participated in the study were married ,followed by never married (i.e. 15(4%)), Living together (i.e. 5(1%) and (i.e. 5(1%)divorced. According to the educational level of the women, Only 52(12.6%) of mothers are illiterate and 84 (20.3%) have completed college education and above and on maternal occupation, More than half of the mothers are house wives 257(62.1%). From those mothers who are employed or self employed, almost half of them 65(45%) earn average monthly income of less than 1000ETB.

Table 1 Socio-demographic characteristics of Mothers Delivered in Brass and Gandhi hospital, Addis Ababa, Ethiopia. January –March 2012

Variables	Total Delivery	
	N	%
Age of mother's(yrs)		
≤19	14	13.4
20-24	110	26.6
25-29	161	38.9
30-34	95	22.9
≥35	34	8.2
Mean+/-SD	27.19+/-4.71	
Pre-Pregnancy weight of mother's (kg)(as reported by the mother)		
≤49	69	17
50-69	195	47
≥70	37	9
I don't know	113	27
Mean+/-SD	56.98+/-10.02	
Term weight of Mother's(kg)(as reported by the mother)		
≤49	7	1.7
50-69	238	57.5
≥70	124	30
I don't know	45	11
Mean+/-SD	66.88+/-10.73	
Height of Mother's(in cm) (As reported by the mother)		
≤149	1	0.2
150-169	156	37.7
≥170	30	7.2
I don't know	227	54.8
Mean+/-SD	162.79+/-5.88	
Educational level of mother's		
Illiterate	52	12.6
Can read and write	4	1
1-4thgrade	40	10
5-8th grade	81	19.6
9-10th grade	82	19.8
TEVT	6	1.4
11-12th grade	65	15.7
college education and above	84	20.3
Mother's Occupation		
Professional	71	17.1
Clerical	7	1.7
Sales and services	38	9.2
Manual labor	31	7.5
House Wife	257	62.1
Average Monthly Income of mother's(in ETB)		
≤1000	65	45
1001-2000	38	26.4
2001-3000	19	13.2
3001-4000	5	3.5
4001- 5000	7	5
≥5000	10	7

In the figure 1 below reasons for delivered by Caesarean according to the mother's response is summarized by Hospital type. From the total mothers delivered by Caesarean, almost half of 62(47%) them didn't know or they have no medical indication to delivered by CS. these are 19(37%) of CS deliveries in Brass and 43(54%) CS deliveries in Gandhi. Only 68(53%) of deliveries were with medical indication i.e. 32(62.7%) in Brass and 36 (44.6%) in Gandhi. The reasons taken as medical indication as per the mother's response were Cardiac problem, obstructed labor, Fetal Distress, post term delivery, previous Caesarean delivery and other health problems. Mothers said the fetus was at risk (Fetal Distress were higher in Both Hospitals which is 15(47%) in Brass and 23(64%) in Gandhi followed by other health problem i.e. 9(28.1%) in Brass and 5(14%) in Gandhi.

Figure 1Type of delivery and reasons for Caesarean delivery by hospital type in Brass and Gandhi, Addis Ababa, Ethiopia, January-March 2012.

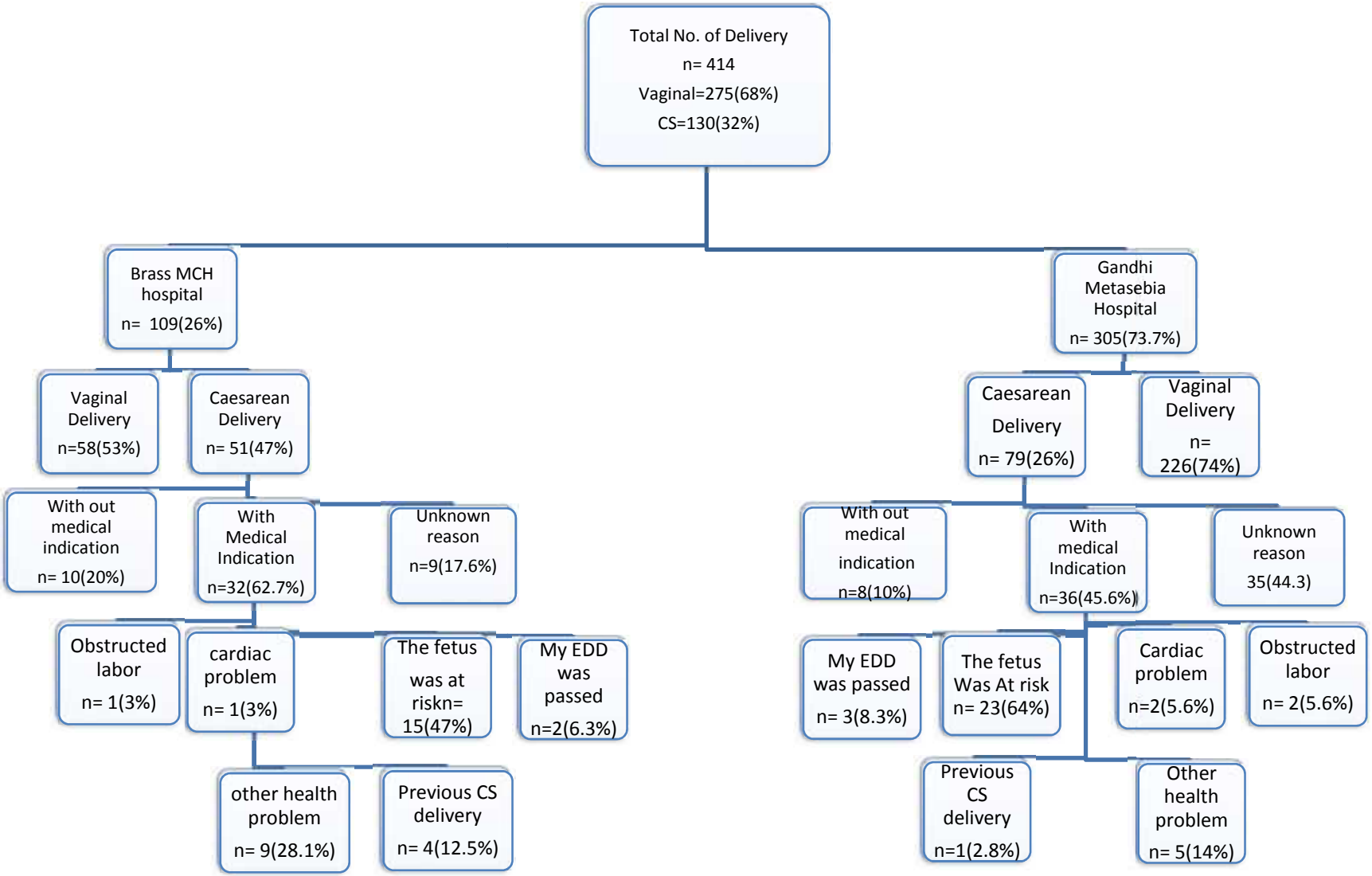

Table 2 and 3 present the prevalence of Caesarean delivery against different socio-demographic and obstetric characteristics of mothers. Out of the total women interviewed, 130 (31.4%) of the mothers have undergone caesarean delivery. The proportion of caesarean delivery in each hospital was 46.8% in Brass (51 mothers out of 109 deliveries) and 26% in Gandhi (79 mothers out of 305 deliveries).From those who delivered by caesarean, only 39(30%) of mothers have completed College education and above where as from those mothers delivered vaginally, 45(15.8%) have completed College education and above. When we see the average monthly income of the mother and their partners, those mothers who delivered by caesarean, 19(33.9%) earn an average monthly income of 1001-200ETB which is higher than the other category and 33(26.6%) their partner's earn more 5000ETB and above. Those mothers delivered vaginally, above half of mothers 48(54.5%) and 64(24.2%) their partners earn at most 1000 ETB which is higher than the other category.

Majority of mothers, 364 (88%) responded that their medical costs related to delivery were covered by themselves or by their partners i.e. 110 (84.6%) delivered by caesarean and 254(89.8%) delivered vaginally. Almost all women 405(97.8%) have attended antenatal care follow up at least one times during their pregnancy i.e 100% mothers of them delivered by caesarean and 97.2% of mothers delivered vaginally. almost half of mothers delivered by Caesarean 57(44.2%) attended antenatal follow up visit more than four times while 129 (46.7%) of mothers delivered vaginally attended antenatal follow up visit three times.

Table 2 Prevalence of Caesarean delivery against Socio-demographic of mothers Delivered in Brass and Gandhi hospital, Addis Ababa, Ethiopia. January –March 2012

Variables	Mode of Delivery			
	C/S		Vaginal	
	N	%	N	%
Type of delivery	130	31.4	284	68.6
Type of Hospital				
Brass	51	39.2	58	20.4
Gandhi	79	60.8	226	79.6
Age of mother's(yrs)				
≤19	2	1.5	12	4.2
20-24	19	14.6	91	32
25-29	59	45.4	102	35.9
30-34	36	27.7	59	20.8
≥35	14	10.8	20	7
Mean+/-SD	28.6+/-4.24		26.6+/-4.79	
Educational level of mother's				
Illiterate	8	6.2	44	15.5
Can read and write	1	0.8	3	1.1
1-4thgrade	9	6.9	31	10.9
5-8th grade	16	12.3	65	22.9
9-10th grade	27	20.8	55	19.4
TEVT	3	2.3	3	1.1
11-12th grade	27	20.8	38	13.4
college education and above	39	30	45	15.8
Average Monthly Income of mother's(in ETB)				
≤1000	17	30.4	48	54.5
1001-2000	19	33.9	19	21.6
2001-3000	8	14.3	11	12.5
3001-4000	2	3.6	3	3.4
4001- 5000	3	5.4	4	4.5
≥5000	7	12.5	3	3.4
Average Monthly Income of partner's(in ETB)				
≤1000	22	17.7	64	24.2
1001-2000	12	9.7	45	17
2001-3000	20	16.1	33	12.5
3001-4000	12	9.7	13	4.9
4001- 5000	9	7.3	13	4.9
≥5000	33	26.6	25	9.5
I don't know	16	12.9	71	26.9
Who cover Delivery related cost				
I/My husband	110	84.6	254	89.8
My employer insurance	10	7.7	3	1.1
My husband's employer insurance	4	3.1	1	0.4
The hospital/for free	2	1.5	6	2.1
My family/relatives	4	3.1	19	6.7

According to the fetal birth weight, 298(72%) births were with birth weight of 2501-3500 gram i.e 87(67.4%) among mothers delivered by caesarean and 211(74.6%) among mothers delivered vaginally. and only 16(4%) were macrocosmic child which is more than 4000gram (9 in caesarean and 7 in vaginal delivery). The majority of births 378(91.3%) were within 36- 42 weeks of gestational age and only 14(3.4%) births were after 42 weeks of gestational age(3 in caesarean and 11 in vaginal delivery) .According to fetal presentation, 383(93%) deliveries were with Vertex presentation, 13(3%) with breech presentation and 14(3%) with transverse presentation (all delivered by caesarean). the sex of the newborn is almost 1:1 ratio that is 213(51%) male and 201(49%) female. As we compare type of hospital against type of delivery and Socio- demographic characteristics (see table 4 below). Caesarean delivery is higher in Brass than Gandhi hospital which is 46.8% and 26 % in Brass and Gandhi respectively. Age of mothers in both hospitals is more or less similar, i.e. Most mothers lie in the age of 20-29 years. Out of the total mothers delivered in Brass, 59(55.7%) of them weigh 70kg and more.

Table 3 Prevalence of Caesarean delivery against Obstetric difference of mothers Delivered in Brass and Gandhi hospital, Addis Ababa, Ethiopia. January –March 2012

Variables	Mode of Delivery			
	C/S		Vaginal	
	N	%	N	%
Attended ANC				
No	0	0	9	3.2
YES	130	100	275	97.2
Number of ANC visits				
Once	0	0	1	0.4
Twice	11	8.5	29	10.5
Three times	41	31.8	129	46.7
Four times	20	15.5	51	18.5
More than Four	57	44.2	66	23.9
Fetal birth weight (gram)				
<1500	2	1.6	4	1.4
1500-2500	11	8.5	37	13.1
2501-3500	87	67.4	211	74.6
3501-4000	20	15.5	24	8.5
>4000	9	7	7	2.5
Gestational Age(week)				
<28	1	0.8	1	0.4
28-30	2	1.5	3	1.1
31-35	5	3.8	10	3.5
36-42	119	91.5	259	91.2
>42	3	2.3	11	3.9
Fetal Presentation				
Vertex	104	80	279	98.6
Breech	11	8	2	0.7
Transverse	14	10.8	0	0
Other	1	0.8	2	0.7
Sex of new born				
Male	61	46.9	152	53.5
Female	69	53.1	132	46.5

Whereas from mothers delivered in Gandhi, 192 (73%) of them weigh between 50-69kg. mothers attended delivery in Brass were more educated than mothers attended delivery in Gandhi which is 38.5% and 13.8% have completed college education and above in Brass and Gandhi respectively. According to the maternal occupation most of the mothers in Both Hospital were house wife i.e 41.3 % and 69.5% in Brass and Gandhi respectively while mothers who are professional were higher in Brass than in Gandhi i.e 33.9% and 11.1% respectively. Almost half of mothers 53 (49.5%) attended delivery in Brass, earn average monthly income of 5000ETB and above while only 5(1.8%) mothers in Gandhi earn this amount of average monthly income. Most of the mothers delivered in Brass have undergone CS before labor started (64.7%) where as in Gandhi 53.2% of CS delivery was given after laboring for at least 8 hours

Table 4 Type of hospital against Type of delivery and socio-demographic and obstetric characteristics

Variables	Type of Hospital			
	Brass		Gandhi	
	N	%	N	%
Type of delivery				
Vaginal	58	53.2	226	74.1
caesarean	51	46.8	79	26
Age of mother's(yrs)				
≤19	1	0.9	13	4.3
20-24	21	19.3	89	29.2
25-29	44	40.4	117	38.8
30-34	30	27.5	65	21.3
≥35	13	11.9	21	6.9
Term weight of Mother's(kg)(as reported by the mother)				
≤49	1	0.9	6	2.3
50-69	46	43.4	192	73
≥70	59	55.7	65	24.7
Mother's Occupation				
Professional	37	33.9	34	11.1
Clerical	2	1.8	5	1.6
Sales and services	21	19.3	17	5.6
Skilled manual labor	4	3.7	5	1.6
Unskilled manual labor	0	0	22	7.2
House Wife	45	41.3	212	69.5
Jobless	0	0	9	3
Average Monthly Income of partner's(in ETB)				
≤1000	3	2.8	83	29.4
1001-2000	5	4.7	52	18.4
2001-3000	11	10.3	42	14.9
3001-4000	8	7.5	17	6
4001- 5000	8	7.5	14	5
≥5000	53	49.5	5	1.8
I don't know	18	16.8	69	24.5
Who cover Delivery related cost				
I/My husband	85	78	279	91.5
My employer insurance	13	11.9	0	0
My husband's employer insurance	5	4.6	0	0
The hospital/for free	1	0.9	7	2.3
My family/relatives	4	3.7	19	6.2
Length of labor before CS Performed				
CS given before labor	33	64.7	13	16.5
Less than 3 hours	4	7.8	10	12.7
4-6 hours	4	7.8	10	12.7
7-8 hours	1	2	4	5.1
More than 8 hours	9	17.6	42	53.2

In Table 5and 6 below shows the Bivariate and multivariate logistic regression. When we see caesarean delivery by type of hospital i.e. Brass (private) hospital and Gandhi (public) hospital, the association is highly significant. Being delivered in Gandhi (public) hospital is protective for caesarean (AOR: 0.52; 95% CI=0.32, 0.82) than delivered in Brass (private) hospital. It was observed that there is no significant difference between the mean age of mothers delivered by Vaginal and mothers delivered by caesarean. There is a significant association between caesarean delivery and among mothers their educational level 11-12th grade and college education. Caesarean delivery among preparatory (11-12th grade) mothers was higher with odds ratio of 3.9(1.6, 9.6) and caesarean among mothers with college diploma and above is highly associated by odds ratio of 4.7(2, 11.3).

Being house wife and unskilled manual labor is significantly protective for caesarean delivery compared to professional mothers with odds ratio of 0.41(0.24, 0.7) and 0.32(0.12, 0.96) respectively .and caesarean delivery among mothers their partner's average monthly income of 3001 to 4000 ETB was 2.68(1.1,6.7) times higher as compared to mothers with their partner's average monthly income level of less than 1000ETB. And it increases with mothers with their partner income of 5000ETB and above, odds ratio of 3.8(1.9, 7.8)**.** Mothers whose medical bill covered by their insurance have shown significant association with caesarean delivery.

Mothers their medical bill covered by insurance is 8(2.6, 25) times higher compared to mothers covered by themselves or by their partner's.

Those attended antenatal care at public health center have shown lower risk to caesarean delivery than attended in hospitals i.e. odds ratio of 0.47(0.3, 0.8).

Table 5 Bivariate and multivariate analysis of mother's Against Socio-demographic and obstetric information, Delivered in Brass and Gandhi hospital, Addis Ababa, Ethiopia. January –March 2012

Variables	C/S	Vaginal	P	Crude OR		Adjusted OR
	%	%		[CI. 95%]	P	[CI. 95%]
Type of Hospital						
Brass†	**39.2***	20.4	0.000	1.000		
Gandhi	60.8	**79.6***	0.000	0.398(0.252, 0.627)	0.009	0.522(0.320,0.852)
Pregnancy health Problem						
No †	26.4	**73.6**		1.000		
Yes	42.4	57.6	0.001	2.053(1.321,3.192)	0.015	1.787(1.121,2.847)
Mother's preferred mode of delivery						
Vaginal†	28.4	**71.6**		1.000		
Caesarean	**89.4***	10.5	0.000	21.402(4.865,94.151)	0.001	13.269(2.931,60.081)
Fetal birth weight (gram)						
<1500†	33.3	66.7		1.000		
1500-2500	23	**77***	0.577	0.595 (0.096, 3.692)		
2501-3500	29.2	70.8	0.826	0.825 (0.148, 4.585)		
3501-4000	45.5	54.5	0.578	1.667 (0.276,10.064)		
>4000	**56.3***	43.8	0.346	2.571 (0.361, 18.326)		
Educational level of mother's						
Illiterate†	15.5	84.5		1.000		
1-8thgrade	21.5	78.5	0.356	1.505(0.631,3.590)		
9-10th grade	31.4	68.6	0.040	2.517(1.044, 6.070)		
TEVT	50	50	0.059	5.500(0.938, 32.249)		
11-12th grade	41.5	58.5	0.003	3.908(1.588, 9.616)		
college education &above	46.4	53.6	0.000	4.767(2.003,11.341)		
Average Monthly Income of partner's(in ETB)						
≤1000†	17.7	**24.2***		1.000		
1001-2000	9.7	17	0.534	0.776(0.349, 1.727)		
2001-3000	16.1	12.5	0.132	1.763 (0.844, 3.684)		
3001-4000	9.7	4.9	0.036	2.685 (1.068, 6.752)		
4001- 5000	7.3	4.9	0.161	2.014 (0.757, 5.357)		
≥5000	**26.6***	9.5	0.000	3.840 (1.887, 7.814)		
Who cover Delivery related cost						
I/My husband†	30.2	69.8		1.000		
Insurance	**77.8***	22.2	0.000	8.082(2.602,25.106)		
The hospital/for free	25	75	0.751	0.770(0.153,3.873)		
My family/relatives	16.7	**83.3***	0.167	0.462(0.154,1.383)		
Site of ANC follow up						
In this hospital†	41.1	58.9		1.000		
Other Government hospital	**58.8***	41.2	0.183	2.046(0.714, 5.866)		
Other Private hospital	43.5	56.5	0.837	1.102(0.437, 2.779)		
Public Health center	24.8	**75.2***	0.004	0.472 (0.284, 0.786)		
Private clinic	42.3	57.2	0.913	1.050 (0.434, 2.543)		

Bold indicates the prevalent, † indicates the referent value*

There is no significant association between caesarean delivery with fetal birth weight and gestational age. While there is a significant association with fetal presentation. All mothers with fetal transverse presentation, 14(3%), delivered by caesarean; and caesarean delivery was 14(3, 67) times higher among Breech presentation than vertex presentation. Caesarean delivery is higher among mothers having health problem during their pregnancy with the odds ratio of 2.1(1.3, 3.2). According to their general health status during pregnancy, those mothers who were healthy and sick during their pregnancy have higher risk than those who were very healthy. i.e with odds ratio of 2.8(1.7,4.7) among mothers who were healthy and odds ratio of 3.9(2.1,7) among mothers who were sick during their pregnancy. There is also similarity with the postpartum health status of the mothers. More than half of the mothers, 252(61%) were healthy after delivery. Mothers who delivered by caesarean were sick by AOR =2.7, 95% CI 1.3, 5.6 than those mothers who delivered by Vaginal.

Mothers who did discuss about caesarean during their pregnancy were 8.8(5.5, 14) times more likely to deliver by caesarean than those who didn't. Mothers who discussed with their health Care providers were times more likely to deliver by caesarean than those mothers who didn't by AOR= 7.5,95 CI(3.4,16).And those who discussed with their husband's and with their Families or relatives were 7(3, 17) and 3(1.2, 9) more likely getting delivered by caesarean respectively.

Table 6 Bivariate and multivariate analysis against Obstetric information and maternal preferred mode of delivery. In Brass and Gandhi hospital, Addis Ababa, Ethiopia. January –March 2012

Variables	C/S %	Vaginal %	P	Crude OR [CI. 95%]	P	Adjusted OR [CI. 95%]
Pregnancy health Problem						
No †	26.4	**73.6**		1.000		1.000
Yes	42.4	57.6	0.001	2.053(1.321,3.192)	0.438	1.259(0.703,2.254)
Postpartum health status of the mother						
Very healthy†	21	**79***		1.000		1.00
Healthy	46.3	53.7	0.000	3.239(1.956,5.364)	0.048	1.931(1.004, 3.712)
Sick	**49.3***	50.7	0.000	3.644(2.068,6.423)	0.006	2.760(1.346,5.662)
Mother's preferred mode of delivery						
Vaginal†	28.4	**71.6***		1.000		1.000
Caesarean	**89.4***	10.5	0.000	21.402(4.865,94.151)	0.048	0.048(0.478,19.608)
caesarean discussion during pregnancy						
NO†	15	**85***		1.000		1.000
YES	**61***	39	0.000	8.861(5.523,14.217)	0.061	2.038(0.968,4.288)
With whom discuss about caesarean						
Health care provider	**77.1***	22.9	0.000	15.737 (9.02, 27.456)	0.000	7.500(3.412,16.486)
My husband	74	26	0.000	7.195 (2.959, 17.496)	0.484	1.602(0.428,5.995)
my family/Relatives	58.8	**41.2***	0.018	3.298 (1.226, 8.869)	0.698	0.743(0.166, 3.321)
Choice of future mode of delivery						
Vaginal†	27	**73***		1.000		
Caesarean	**85***	15	0.000	15.333 (4.356 ,53.975)	0.053	4.714(0.983,22.613)
I have no plan for another child	28.4	71	0.770	1.076 (0.659, 1.756)	0.544	0 .827(0.448,1.527)
I don't know	44	56	0.077	2.126 (0.920, 4.911)	0.233	1.892(0.664,5.392)
When was discussed with your health care provider about caesarean?						
First Trimester†	38.5	61.5		1.000		
Second Trimester	50	50	0.637	1.600 (0.227, 11.266)		
Third Trimester	78.9	21.1	0.010	6.000 (1.536 ,23.438)		
Throughout my pregnancy	23.7	**76.3***	0.307	0.497 (0.129, 1.905)		
During labor	**83.7***	16.3	0.002	8.200 (2.126,31.629)		
Gestational Age(week)						
<28†	**50***	50		1.000		
28-30	40	60	0.810	0.667(0.025, 18.059)		
31-35	33.3	66.7	0.648	0.500(0.026,9.770)		
36-42	31.5	68.5	0.584	0.459(0.028, 7.408)		
>42	21.4	**78.6***	0.404	0.273(0.013, 5.768)		

Bold indicates the prevalent † indicates the referent value*

Those mothers who did discuss during third trimester and during labor have more likely of getting delivered by caesarean than those who discussed in the first trimester, with odds ratio of 6(1.5, 23) and 8(2, 31.6) respectively.

According to their future preferred mode of delivery, those mothers who delivered by caesarean at this time prefer to deliver by caesarean in the future by OR of 15(4.4, 54) times higher than those who delivered vaginal at this time.

6. Discussion

The study has tried to asses caesarean-section delivery and associated Factors in The case of one public (Gandhi) and one private (Brass) hospital in Addis Ababa, Ethiopia.

This study revealed that the overall proportion of caesarean delivery in both hospitals was 32 %. As the Who Recommendation of Caesarean delivery, that caesarean section rate greater than 10-15 % is not acceptable in any region of the world(25) . And in recent years this trend increases in different region of the world .it rises up to 46% in china and 26% and above in many Asian countries, Latin America and USA (25). Study conducted in Sri Lanka showed that in 2010 Caesarean delivery ranges from 31.8% to 44.2% in different type of hospital which is higher than the 2007 Caesarean rate fluctuated between 29.6% and 33.5% (26). Even if this result elucidate caesarean delivery rate only in the two hospitals of Addis Ababa, the finding is a good indicative that caesarean delivery is higher in the city of Addis Ababa. As the EDHS 2011 shows delivery with caesarean accounts 21.8% in Addis Ababa(7).

The binary logistic regression indentified that Caesarean delivery is significantly associated with Socio-Demographic and obstetric factors. Maternal education level, Occupation and partner's income level have significant association with CS delivery. Mothers with education level of 9-10th grade have 2.5(1.1, 6.1) more likely to undergone Caesarean. Mothers with grade 11-12th 3.9(1.6, 9.6) times and mothers who completed College education and above 4.7(2,11) times more likely to have Caesarean delivery than illiterate mothers. According to previous study in Brazil, caesarean delivery was higher among wealthy and educated women than poor and less educated(14) . According to the EDHS 2011 mothers who completed Secondary and more than secondary education have higher Caesarean rate i.e 14.6% and 13.6% respectively comparing to mothers with no Education and primary education i.e 0.45 and 2.4% respectively (7). Being unskilled manual labor and house wife are protective for Caesarean delivery. Mothers their

occupation were unskilled manual labor have less likely to delivered by Caesarean delivery than mothers who work professional work (OR: 0.32(0.1, 0.9). And mothers who are house wife have less likely by OR of 0.4(0.24, 0.69) to delivered by caesarean than mothers who are professional. Studies in southern Europe also show similarity with this finding that caesarean delivery was higher among non manual workers (33%) than among manual workers (24%) (20).

Family income also significantly associated with Caesarean delivery. Delivered by Caesarean is 2.7 (1.1, 6.7) times higher among mothers with their partner's average monthly income of 3001to 4000ETB and 3.8(2, 7.8) times higher among mothers their partner's average monthly income of 5000ETB and above than mothers their partner's Average monthly income of at most 1000ETB. This Finding is similar with EDHS 2011 findings that caesarean delivery is 7.2% among highest wealth quintile where as 0.1% among the lowest wealth quintile(7) . And a retrospective study done in developing countries showed that, Rich to poor ratio of caesarean delivery ranged from 3.1 in Madagascar to 25.7 in Zambia (27).study conducted in china on factors influencing in the rising of Caesarean delivery identified that caesarean section was more common in well educated, wealthy women and those who have health insurance (28).

Mothers who covered their delivery cost by their or their partner's employer insurance were 8.1(2.6, 25) times more likely to delivered by caesarean than those mothers who covered their medical cost by themselves. Since the 95% confidence interval is very wide the association is less significant. This may be due to majority of mothers in this study covered their medical cost by their partner's hence the mothers covered their medical cost by Insurance is very small to see significance. Likewise, research conducted in three hospitals of Greek signified that those mothers with private insurance were 7.73 times more likely to undergo caesarean delivery than those who paid directly (19).

When we see on the obstetric characteristics, almost all mothers 405(97.8%) attended ANC follow up at least once. And 47.7% of them who are delivered by Caesarean attended ANC follow up at Public health center while 68.1% of mothers who delivered vaginal attended ANC follow up at public health center. Mothers who attended ANC follow up at public health center protected from Caesarean delivery by 0.47(0.28, 0.78) than those mothers who attended ANC follow up delivered in the respective hospitals.

Most mothers get delivered with a normal fetal weight of ranges 2501 to 3500 gm which is 67.4% delivered by caesarean and 74.6% delivered vaginally. Only 16(4%) babies were macrocosmic (more than 4000gm) which is 9 among those delivered by caesarean and 7 among those delivered vaginal. And almost all mothers delivered within the term gestational age (36-42 weeks) which is 91.5% of mothers those delivered by Caesarean and 91.2 % those mothers delivered vaginally. Only 2.3% in caesarean and 3.9% in vaginal delivery were post term (after 32weeks). Study conducted in three hospitals of Greek showed that Fetal birth weight >4000gram and Gestational age longer than 36 weeks predicted for caesarean delivery (19). However, in this study there is no significant association of fetal birth weight and gestational age with caesarean delivery. Fetal presentation has shown significant association with caesarean delivery. All mothers with fetal lying of transverse (14 out of 130 caesarean deliveries) were undergone caesarean delivery. Whereas mothers with fetal presentation of Breech have association with a wide range of confidence interval, i.e OR 14(3, 67) times more likely to deliver by caesarean than mothers with Fetal presentation of Vertex. It is difficult to see association with only 19 mothers delivered in breech presentation , however, this study has similarity with Study conducted in Brazil at university hospital showed that prevalence of caesarean delivery among Breech and other abnormal lies was 100 %(29, 30).

According to the general health status of mothers during Pregnancy, mothers who had health problem during pregnancy have 2. (1.3, 3.2) times higher risk of delivering by Caesarean than mothers who were very healthy during pregnancy. Similarly mother who delivered by caesarean were 3.6(2, 6.4) times higher to be sick than those mothers who delivered vaginally (AOR=2.7 95% CI; 1.3, 5.6). Research conducted in Canada showed that, the overall maternal morbidity were higher by AOR of 3.1 in mothers who delivered by caesarean than mothers who delivered vaginally(6). The WHO global survey on maternal and prenatal health through 2004-2008 conducted in 24 countries identified that ante partum Caesarean delivery without medical indication presented with increase risk of death, admission to ICU, blood transfusion and hysterectomy than spontaneous vaginal delivery (AOR: 14.29, 95%CI. 10.9 to 18.7) (31).

Mothers who discuss about caesarean delivery during their pregnancy have 8.8(5.5,14) times more likely to delivered by caesarean than mothers who didn't and mothers who discuss about caesarean delivery with their health care provider have more likely to deliver by Caesarean than mothers who didn't with AOR of 7.5(3.4, 16) and mothers who discuss with their husband and family/relative have 7(3,17) and 3.2(1.2,8.8) times higher to delivered by caesarean than those who didn't respectively.

The period that did discussion with health care provider have positive significant with Caesarean delivery. Mothers who did discussion in third trimester and during labor have higher risk of CS delivery than mothers who did discussion in the first trimester by OR of 6(1.5, 23) and 8.2(2.1, 31.6) respectively. This result predicts, discussion about cesarean delivery may motivate mothers to deliver by Caesarean or mothers who discuss about caesarean delivery may be mothers who have underlying risk factor to deliver by caesarean.

In figure 1 above, Caesarean delivery without medical indication is higher in both hospitals. According to the mother's response to the reasons why delivered by CS showed that 62(47%) of the

CS deliveries were performed without medical indication or mothers didn't know why delivered by CS. Out of this 18(14%) was without medical indication which is higher comparing to the results from other country. According to the WHO global survey on maternal and prenatal health conducted in 24 countries, in 23 out of 24 countries the overall CS delivery without medical indication ranged from 0.01% to 2.1% while extremely higher in the institution selected from in china i.e. 11.6%(31).

And 44(34%) with unknown reason as the mothers response. That is 35(44.3%) was in Gandhi and 9(17.6%) was in Brass. When we see the results according to the length of labor before CS performed in each hospital (Table 4), in Gandhi half of the CS delivery (53.2%) undergone after laboring for 8 hours and in Brass only 17.6%. therefore, this result can indicate us the CS may given after labor failed (Dysfunctional labor) which can lead us to medically indicated CS. only 68(52%) of mothers respond their reasons with medical indication such as cardiac problem, Fetal distress, obstructed labor, previous CS delivery, post term and other health problems. Studies conducted in Taiwanese women on the other hand showed that among the medical indicated caesarean deliveries, 82.6% accounted for mal-presentation, prior caesarean delivery and Dysfunctional labor (15).

Type of hospital has a strong significant association with Caesarean delivery (P-value: 0.009). Caesarean delivery is higher in Brass (from private hospital) than in Gandhi (from public hospital) with a proportion of caesarean delivery 47% and 26% respectively. Being delivered in Gandhi was protective for caesarean delivery by AOR of 0.52(0.32, 0.85). Similar studies conducted in other countries also show similar results. If we consider the study in southern Brazil, the city of Rio Granade, the rate of caesarean delivery has generally accounted for 51.6% with 85.8% rate among private hospitals/users and 42.6% among public institutions/users(10). And another study

conducted in Greek at three hospitals showed, CS rate in the public hospitals was 41.6%, while the CS rate in the private hospital was 53%(19).

In this study, Maternal Age, parity and BMI have not significant association with CS delivery. However, Studies conducted in two university affiliated clinics showed that Obesity has strong relationship with caesarean delivery (18)and in Scotland showed that with increasing age and weight of mothers, caesarean delivery Increases(32) .

The researcher has used primary data to reach at the conclusions and recommendations made, which can be considered as one of the strengths of the research paper. Moreover, it tried to address data both from the public and private institutions which also contributed a lot to the reliability of the data. The main strength of this research paper is that there are no such national researches conducted on the subject matter and thus this paper is of great importance to be used as input for researchers who are interested in the subject matter and want to carry out further researches.

The research however has some limitations that it considered data collected only from two health institutions and hence the findings can only represent for the two hospitals and cannot represent the features of all health institutions in Addis Ababa. Moreover, the research was carried out based on the responses provided by mothers and thus data on medical indications cannot be captured only through mothers' response, considering the awareness level of mothers and the 'client-provider' relationship in our context.

7. Conclusion

The study has tried to answer the hypothesis that Mode of delivery depends on Type of Hospitals/Private Vs public/. The result of the study showed that proportion of caesarean delivery is high in the city of Addis Ababa and thus the rate has gone beyond the WHO recommendation for caesarean. Type of hospital and pregnancy health problem has been observed as a main contributing factor for the increasing caesarean in the city; with the private hospital showing a higher rate while the rate in public hospitals was significantly lower and CS delivery is higher among those mothers who were sick during their pregnancy.

The finding also signified that not all caesarean deliveries were made due to medically indicated problems and thus would have been possible to avoid some of the unnecessary caesarean deliveries. Most of the caesarean deliveries in the private hospital indicated that they were performed earlier than the recommended labor hours, which implies there were possibilities of delivering with vaginal delivery.

Post partum health status of mothers also associated with CS delivery. Which is mothers who delivered by CS have higher chance to be sick than mothers delivered vaginal.

8. Recommendation

From the observation of the findings in this study, the following recommendations have been forwarded to further address the issue.

1. Relevant government institutions should make strict follow up and should able to introduce a functional monitoring and evaluation system on the Caesarean delivery service they provide and the ethical considerations.
2. This study was focused on the factors contributing to caesarean delivery and data was collected only from two hospitals. Therefore further studies with representative sample of hospitals from both private and public should be studied. Moreover, qualitative study should be conducted to see factors which are not concluded only with quantitative data.
3. Mothers should be aware about their case why they are delivered by caesarean section and decided accordingly

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10. Annexes

Annex 1: Information sheet and Consent form in English version

UNIVERSITY OF GONDAR

AND

ADDIS CONTINENTAL INSTITUTE OF PUBLIC HEALTH

Information Sheet and consent form for Assessment of factors associated to Caesarean delivery in two hospitals of Addis Ababa, Ethiopia

Name of the Principal Investigator: Tsigie G/Tsadik G/Her

Name of the organization: University of Gondar/Addis Continental Institute of Public Health

Introduction

The investigator prepares this information sheet and consent form aiming to Assess the Associated Factors of caesarean delivery among mothers delivered in two selected hospitals of Addis Ababa City administration, Ethiopia. If you are willing to participate in our project, you need to understand the consent form.

Purpose: The purpose of this research is to Asses caesarean-section delivery and factors associated to Caesarean-section delivery. Factors such as demographic, Socio-economic and obstetric factors will be assessed among the mothers delivered in the selected two hospitals of Addis Ababa.

Therefore, the finding of this study will contribute substantial role in utilization and monitoring of Caesarean-section deliveries and it helps to improve the maternal health care service practices.

Procedure: If you are willing to participate in our project, you will be asked to give your response by the data collectors.

Risk and/or Discomfort: By participating in this research project, you may feel that wasting your time (**about 20-30minutes)** however, this is insignificant when you comparing its benefits, that improving the health care service will benefited you directly or indirectly by improving the health status of the community. There is no harm or risk in participating in this research project.

Benefits: you may not get direct benefit by participating in this research project but your participation is very important because, this will give an insight for the improving an obstetric care in the country which benefits the community as a whole.

Incentives: you will not be provided any incentives to take part in this project.

Confidentiality and Anonymity: Information about you that will be collected from the study will be stored in a file, which will not have your name on it but a code number assigned to it. In addition, the file will be kept under lock and key, and it will not be revealed to anyone except the principal investigator.

Right to Refuse or Withdraw: You have the full right to refuse from participating in this research (you can choose not to respond some or the entire question) if you do not wish to participate; and this will not affect your health services you get from any health facilities. You have also the full right to withdraw from this study at any time you wish to, without losing any of your right.

Contact Person: If you have any question or concern you can ask at any time through the following Address.

1. Tsigie G/Tsadik G/Her: Addis Continental Institute of Public Health./ University of Gondar

   Tel: +251920641721 Email: tszadik@yahoo.com or tsigieg@gmail.com
2. Ewenat Gebrehanna: Addis Continental Institute of Public Health

   Tel: +251114663302 Email: ewenatgebrehanna@addiscontinental.edu.et

If you read and understand and if you are agree to participate in this study, please check in the box below

Do you agree to participate in the study Yes ☐ No ☐ Date _____

Name of the interviewer ---------- Signature ----------

Annex 2: information sheet and Consent form In Amharic Version

የጥናት/ምርምር / ማብራርያና የስምምነት መግለጫ ቅጽ

የጥናት ፕሮጀክቱ ርዕስ ፡ በአዲስ አበባ ከተማ በሁለት ሆስፒታሎች የሚሰጡ የወሊድ አይነትና ተዛማጅ ምክንያቶች፡፡

የዋና ተመራማሪ ስም ፡ ፅጌ ገብረፃድቅ ገ/ሔር

የ ድርጅቱ ስም ፡ አዲስ ኮንቲኔንታል የጤና አጠባበቅ ኢኒሰቲቱት ና ጎንደር ዩኒቨርሲቲ

ይህ ማብራሪያና የስምምነት መግለጫ ቅጽ የተዘጋጀው በጎንደር ዩኒቨርሲቲ፤አዲስ ኮንቲኔንታል የጤና አጠባበቅ የድህረ ምረቃ (MPH) ተማሪ ና አዲስ ኮንቲኔንታል የጤና አጠባበቅ ኢንስቲቱት አማካሪ አማካኝነት ነው፡፡

መግቢያ፡

በ አዲስ አበባ መስተዳድር በ ሁለት ሆስፒታሎች የሚወልዱ እናቶች የወሊድ አይነትና ተዛማች ጉዳዮች ለማወቅ የሚደረግ ጥናት እርስዎ እንዲሳተፉ ጋብዘንዎታል ፡፡ በዚህ ጥናት ውስጥ ለመሳተፍ ከተስማሙ ስምምነቱን በደንብ መረዳት ይገባዎታል፡፡ ከዚያ በመቀጠል በጥናቱ መረጃ ሰብሳቢዎች ለሚጠየቁት ጥያቄ እንዲመልሱ ፈቃደኝነትዎ ይጠየቃል፡፡

የምርምር ፕሮጀክቱ አላማ፡

የዚህ የምርምር አላማም ሁለት በአዲስ አበባ ለይ የሚገኙ ሆስፒታሎች በአፕሬሽን ና በምጥ የሚወልዱ እናቶችና ተዛማጅ ጉዳዮች ለማየት የሚካሄድ ሲሆን መጠይቁም ዲሞግራፊ፤ማህበራዊ፤ ኢኮኖሚያዊና ከወሊድ ጋር የተያያዙ ጥያቄዎች ይኖሩታል፡፡ ስለ ሆነም በጥናቱ የሚገኘው መረጃም ለጤና አገልግሎት እቅድ ባለሞያዎችና ለጤና ስራ አመራሮች ከፍተኛ ፋይዳ ይኖረዋል ::

ሊከሰቱ የሚችሉ ስጋቶችና ምቾት መጓደሎች፡

ምናልባት ጊዜዎን ማለትም ከ 20 አስከ 30 ደቂቃ ሊሻማብዎ ይችል ይሆናል ፡፡ ነገር ግን ከሚያስገኘው ጥቅም አኳያ ሲታይ ይህን ያህል አይደለም፡፡ በዚህ ጥናት በመሳተፍዎ ምንም ዓይነት ችግር አያጋጥመዎትም፡፡

ጥቅሞችናማካከሻ፡

በዚህ ጥናት በመሳተፍዎ የተለየ ጥቅም ወይም ማካከሻ ኣያገኙም ፡፡ ነገር ግን የእርስዎ በጥናቱ መሳተፍ ለጥናቱ ኣስፈላጊ ስለሆን በኣናቶች ጤና ለሚቀረፁ እስትራቴጂዎች ሊረዱና በኣገሪቱ የሚኖረው የእናቶች ጤናም ጉልህ ኣስተዋፅኦ ሊያበረክት ይችላል ፡፡

ሚስጥር ስለመጠበቅ፡

ከዚህ ጥናት የሚገኝ መረጃ በሙሉ በምስጢራዊነት ይጠበቃል፡፡. ለዚህ ጥናት የሚሠበሰበው እርሰዎ የሚመለከት መረጃ በማህደር የሚቀመጥ ሲሆን ማህደሩም በስምዎ ሳይሆን በተለየ ኮድ ሲቀመጥ ኮዱ ከዋናው ተመራማሪ ውጪ ለማንም ኣይገለጽም፡፡

በጥናቱ ያለመሳተፍ ወይም ራስን የማግለል መብት፡

በጥናቱ ላለመሳተፍ ከፈለጉ በዚህ ጥናት ያለመሳተፍ ወይም ከኣንድ በላይ ወይም ሁሉንም ጥያቄዎች ኣለመመለስ ይችላሉ፡፡ በዚህ ጥናት ባለመሳተፍዎ ወይም በከፊልም ሆነ በሙሉ ጥያቄዎችን ባለመመለስዎ የሚያጡት ኣገልግሎት ኣይኖርም፡፡

የሚገናኟቸው ሠዎች ፡

በጥናቱ ዙሪያ ማንኛውም ጥያቄ ካልዎት ከሚከተሉ ማንኛውም ሠው በሚፈለጉት ጊዜ ማነጋገር ይችላሉ፡፡

1. ፅጌ ገብረፃድቅ ገ/ሔር ፡ ኣዲስ ኮንቲኔንታል የጤና ኣጠባበቅ ኢንስቲቱት

ስልክ ቁጥር ፡ +251920641721 ኢመይል ፡ tszadik@yahoo.com or tsigieg@gmail.com

2. እውነት ገብረሃና ፡ ኣዲስ ኮንቲኔንታል የጤና ኣጠባበቅ ኢንስቲቱት

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በጥናቱ ለመሳተፍ ተስማምተዋል? **ኣዎ** ☐ **ኣልተስማማሁም** ☐ ቀን _____

የጠያቂው ስም _____ ፊርማ _____

Annex 3 Questionnaire in English version

Questionnaire on Assessment of caesarean delivery and Associated factors among mothers delivered in Two selected Hospitals of Addis Ababa

General Information

Starting Time: _____ Region: _____Sub City: _____Woreda: _____

Type of Health Facility/Hospital: ☐ Private ☐ Public

Part -1. Demographic information of Respondent		
Question code	**Question**	**Response**
101	How old are you? **(Write age in completed years)**	Age in years _____ I don't know ……88 No response…….99
102	How much did you weight just before your pregnancy?	Weight in Kg_____ I don't know ……88 No response…….99
103	How much did you weight during the last week of your pregnancy?	Weight in Kg_____ I don't know ……88 No response…….99
104	What is your Height? **(write height in centimeters)**	Height in cm _____ I don't know ……88 No response…….99
105	What is your Marital Status?	Never Married 1 Married 2 Living together 3 Divorced 4 Separated 5 Widowed 6
106	What is your educational level?	Illiterate 1 Can read and write 2 1-4th grade 3 5-8th grade 4 9-10th grade 5 TEVT 6 11-12th grade/ preparatory 7 College education and above 8
Part-2 socioeconomic information of respondent		

201	What is your Occupation?	Professional 1 Clerical 2 Sales and Services …… …3 Skilled Manual labor …. 4 Unskilled manual labor… 5 House Wife ……...6 Other (Specify) _____ No response …….. 99
If answer for 201 is house wife ,skip 202		
202	What is your average monthly Income?	Less than 600 ETB…...1 600-1000 ETB……. 2 1001- 2000 ETB…….. 3 2001-3000 ETB …….. 4 3001-4000ETB ……5 4001-5000ETB…….6 More than5000ETB….7 No response…… 99
If she is not married or living together ,skip 203 &204		
203	What is Your husband/ partner's Occupation?	Professional 1 Clerical 2 Sales and Services 3 Skilled Manual labor 4 Unskilled manual labor 5 Other (Specify) _____ No response 99
204	What is your partner's average monthly income?	Less than 600 ETB 1 600-1000 ETB 2 1001- 2000 ETB 3 2001-3000 ETB 4 3001-4000ETB 5 4001-5000ETB 6 More than5000ETB 7 No response 99
205	Who covers your medical bill when you give birth?	I/ my husband cover my medical bill 1 My employer insurance cover my medical bill 2 My husband's/ partner's insurance cover my medical bill 3 Others (specify) _____ No response 99
Part-3 Respondent's obstetric Information		
301	**Maternal information** Were you attending antenatal	No 0 Yes 1

	care during your last pregnancy?	
If the answer for 301 is No, skip 302,303 &304		
302	How many visits?	Once 1 Twice 2 Three times 3 Four Times 4 More than 4 visit 5 I don't know 88
303	When was the first ANC follow up?	In the first 3 months of pregnancy 1 4-6 months of pregnancy 2 After the 7th month of pregnancy 3 I don't know 88
304	Where was the ANC follow up?	In this hospital 1 Other government hospital 2 Other private hospital 3 Public health center 4 Private clini caesarean 5 Other (specify)_____
305	How many pregnancies do you ever have?	One 1 Two 2 Three 3 Four 4 More than four 5 No response 99
306	How many deliveries do you ever have before?	One 1 Two 2 Three 3 Four 4 More than four 5 No response 99
307	Have you ever had an abortion or a miscarriage before?	No 0 Yes 1 No response 99
308	Did you ever have a still birth before?	No 0 Yes 1 No response 99
309	How do you describe your general health status during the last pregnancy?	Very healthy 1 healthy 2 sick 3 very sick 4
310	Were there any health problem during your last pregnancy? **(it could be any complication /medical problems**)	No 0 Yes 1
If the answer for 310 is No, skip 311		
311	What were the problems?	Vaginal Bleeding/Spotting 1

	(More than one answer is possible. Probe by saying 'what else?' Circle all the responses the woman give)	Generalized Body Swelling 2 Swelling of feet 3 lower abdominal pain 4 *Fever* *5* *Headache* *6* *Chills* *7* *sweating* 8 Other(specify) _____ No response 99
312	What is your ideal choice of mode of delivery?	Vaginal 1 Caesarean 2
313	Have you ever discussed about caesarean delivery during your pregnancy?	No 0 Yes 1
If the answer for 313 is No, skip 314&315		
314	With who have you ever discussed about caesarean ? **(More than one answer is possible. Probe by asking each option)**	Health care provider 1 Husband 2 Female friends with previous caesarean delivery 3 Female friends with previous vaginal delivery 4 With my mother 5 Other (Specify)_____
315	When did discussed With your Health care provider about caesarean delivery?	During the first 3 months of pregnancy 1 During the 4^{th}-6^{th} months of pregnancy 2 After the 6^{th} month of pregnancy but before labor started 3 Throughout my pregnancy 4 During labor 5 I don't know 88
316	Did you have a caesarean delivery before?	No 0 Yes 1
If the answer for 316 is No, skip 317		
317	When was the previous caesarean delivery?	1^{st} delivery 1 2^{nd} delivery 2 3^{rd} delivery 3 4^{th} delivery 4
Only for mother's delivered by Vagina		
318	Have you considered caesarean delivery?	No 0 Yes 1

319	What makes you decide to choose vaginal delivery? **(More than one answer is possible. Probe by asking each option)**	Labor was fast 1 I was afraid of operations 2 caesarean may prevent me from having as much as children in the future 3 Labor was easy 4 I was healthy 5 Others(specify)_____
320	Would you recommend vaginal delivery for another pregnant woman?	No 0 Yes 1 I don't know 88
Only for mother's delivered by caesarean		
321	Why did you deliver by caesarean this time? **(More than one answer is possible. Probe by asking each option)**	I was very sick during labor 1 I had a cardiac problem 2 I had other health problems 3 Previous caesarean delivery 4 Fear of labor pain 5 Caesarean have lower risk than vaginal delivery 6 The fetus was at Risk 7 My due date of delivery was passed 8 Other (Specify)_____ I don't know 88
322	How long have you labored before undergoing caesarean ?	The caesarean was given before labor started 1 Less than 3 hours 2 4-6 hours 3 7-8 hours 4 More than 8 hours 5 I don't know 88
323	Would you recommend caesarean for another pregnant woman?	No 0 Yes 1 I don't know 88
Ask for all women		
324	When was your last delivery	This is my first delivery 1

	before the current delivery?	Less than one year 2 1-2 year 3 More than 2 year 4
If this is her first delivery, skip 325		
325	Where did you give birth in the previous deliveries?	Government hospital 1 Private hospital 2 Public health centers 3 Private clini caesarean 4 Others(specify)_____
326	How do you rate your general health status after giving birth?	Very healthy 1 Healthy 2 Sick 3 Very sick 4
327	How do you rate the health status of your baby?	Very healthy 1 Healthy 2 Sick 3 Very sick 4 Other (specify)_____
328	If you have another child in the future, what would be your mode of delivery?	Vaginal 1 caesarean 2 I have not plan for another child 3 I don't know 88
The interviewer will fill from the mother's card		
329	**Neonatal Information** what was the birth weight of the new born ?(gram)	<1500 1 1500-2500 2 2501-3500 3 3501-4000 4 > 4000 5
330	How long the Gestational age of the fetus? (weeks)	<28 1 28-30 2 31-35 3 36-42 4 42^{+} 5
331	What was the Presentation of the fetus?	Vertex 1 Breech 2 Transverse 3 others (Specify)_____
332	What is Sex of the new born?	Male 1 Female 2

Thank you for your participation in the study

Time the interview has been completed ----------

Annex 4 Questionnaires in Amharic Version

ለእናቶች የተዘጋጀ በአፕሬሽን መውለድና ተዛማጅ ምክንያቶቻቸው የሚመለሱ መጠይቆች

ጠቅላላ መረጃ

የተጀመረበት ሰዓት፡ _____ ክልል :_____ክፍለከተማ : _____ወረዳ : _____

_የጤና ተቋሙ/የሆስፒታሉ ኣይነት : ☐ የግል ☐ የመንግስት

ክፍል-1 ስለ መላሹ ዲሞግራፊ መረጃ		
የጥያቄ መለያ ቁጥር	**ጥያቄ**	**መልስ**
101	እድሜዎ ስንት ይሆናል? (እድሜዎ በሙሉ ዓመት ይፃፍ)	ዕድሜ በኣመት ---------- ኣላውቀውም 88 መልስ የለም 99
102	ከማርገዝዎ በፊት የነበርዎት ክብደት ምን ያህል ነበር? (በኪ.ግ)	ክብደት በኪ.ግ ---------- ኣላውቀውም 88 መልስየለም 99
103	በመጨረሻ የእርግዝናዎ ሳምንት ክብደትዎ ስንት ነበር? (በኪ.ግ)	ክብደት በኪ.ግ ---------- ኣላውቀውም 88 መልስየለም 99
104	ቁመትዎ ስንት ነው ? (ቁመት በሴ.ሜ ይፃፍ)	ቁመት በ ሴ.ሜ ---------- ኣላውቀውም 88 መልስየለም 99
105	የጋብቻ ሁኔታዎ እንዴት ነው ?	ያላገባች 1 ያገባች 2 ኣብረውየሚኖሩ 3 የተፋታች 4 የተለያየች 5 የሞተባት 6
106	የትምርት ደረጃዎ ስንት ነው ?	ያልተማረች 1 መማንበብናመፃፍየምትችል 2 ከ1-4ኛክፍል 3 ከ5-8ኛክፍል 4 ከ9-10ኛክፍል 5 ቲቪቲ 6 11-12ኛክፍል 7 ኮሌጅናከዛበላይ 8
ክፍል -2 የመላሹ ማህበራዊ ሁኔታ		

201	ስራዎ ምንድን ነው?	ባለሙያ	1
		ሴክረታሪ	2
		ንግድናኣገልግሎትሰጪ	3
		የሰለጠነየጉልበትስራ	4
		ያልሰለጠነየጉልበትስራ	5
		የቤትእመቤት	6
		ሌላ (ይገለፅ) _____	
		መልስየለም	99
የቤት እመቤት ከሆነ 202 ይዝለሉት			
202	የወር ገቢዎ በአማካኝ ምን ያህል ነው?	ከ600ብርበታች	1
		ከ600-1000ብር	2
		ከ1001-2000ብር	3
		2001-3000ብር	4
		ከ3001-4000ብር	5
		ከ4001-5000ብር	6
		ከ5000ብርበላይ	7
		መልስየለም	99
ያገባች ወይም አብረው የሚኖሩ ካልሆነች ቁጥር 203 ና204 ይዘለል			
203	የባለቤትዎ ስራ ምንድነው ?	ባለሙያ	1
		ሴክረታሪ	2
		ንግድናኣገልግሎትሰጪ	3
		የሰለጠነየጉልበትስራ	4
		ያልሰለጠነየጉልበትስራ	5
		ሌላ (ይገለፅ) _____	
		መልስየለም	99
204	የ ባለቤትዎ የ ወር አማካኝ ገቢ ምን ያህል ነው?	ከ600ብርበታች	1
		ከ600-1000ብር	2
		ከ1001-2000ብር	3
		2001-3000ብር	4
		ከ3001-4000ብር	5
		ከ4001-5000ብር	6
		ከ5000ብርበላይ	7
		አላውቀውም	88
		መልስየለም	99
205	የወሊድ ወጪዎ ማነው የሸፈነልዎት?	እኔ/ባለቤቴነውየሸፈነው	1
		የቀጣሪዬ፡ኢንሹራንስነውየሸፈነልኝ	2
		የበባለቤቴቀጣሪኢንሹራንስነውየሸፈነልኝ	3
		ሌላ (ይገለፅ) ----------	

		መልስየለም	99
ክፍል-3 የመላሹ ከወሊድ ጋር የተያያዘ መረጃ			
301	ባለፈው እርግዝናዎ የ ቅድመ ወሊድ ክትትል ኣድርገው ያውቃሉ ?	ኣላደረግኩም	0
		ኣዎ	1
የቁጥር 301 መልስ ኣላደረግኩም ከሆነ ቁጥር 302፣303 ና 304 ይዘለል			
302	ስንት ጊዜ ክትትል ኣድርገዋል?	ኣንዴ	1
		ሁለቴ	2
		ሶስቴ	3
		ኣራቴ	4
		ከ4ጊዜበላይ	5
		ኣላውቀውም	88
303	የመጀመርያ የቅድመ ወሊድ ክትትልዎ መቼ ነበር?	በመጀመርያዎቹ ሶስት የእርግዝና ወራት	1
		ከ4-6ባለውየእርግዝናወራቶች	2
		ከ7 ወር በኋላ ያሉ የእርግዝና ወራቶች	3
		ኣላውቀውም	88
304	ክትትል ያደረጉበት ጤና ተቋም የት ነበር?	እዚሁሆስፒታል	1
		ሌላመንግስትሆስፒታል	2
		ሌላየግልሆስፒታል	3
		የመንግስትጤናጣብያ	4
		የግልክሊኒክ	5
		ሌላ (ይገለፅ) ----------	
305	የ ኣሁኑን ጨምሮ ስንቴ ኣርግዘዋል?	ኣንዴ	1
		ሁለቴ	2
		ሶስቴ	3
		ኣራቴ	4
		ከ4ጊዜበላይ	5
		መልስየለም	99
306	የ ኣሁኑን ጨምሮ ስንቴ ወልደዋል ?	ኣንዴ	1
		ሁለቴ	2
		ሶስቴ	3
		ኣራቴ	4
		ከ4በላይ	5
		መልስየለም	99
307	ውርጃ ኣጋጥምዎት ያውቃል?	ኣየውቅም	0
		ኣዎ	1
		መልስየለም	99
308	ሙት ወልደው ያውቃሉ ?	ኣየውቅም	0

		አዎ	1
		መልስየለም	99
309	በአሁኑ እርግዝናዎ የነበረ የጤናዎ ሁኔታ እንዴት ይመዝኑታል ?	በጣምጤነኛነበርኩ	1
		ጤነኛነበርኩ	2
		እታመምነበር	3
		በጣምእታመምነበር	4
310	በእርግዝናዎ ወቅት ያጋጠምዎት የጤና ችግርነበር? **(ምንም አይነት የጤና ችግር ሊሆን ይችላል)**	አልነበረም	0
		አዎ	1
310 መልስዎ አልነበረም ከሆነ ቁጥር 311 ይዝለሉት			
311	የጤና ችግሩ ምን ነበር? **(ከአንድ በላይ መልስ ይቻላል ለማስታወስ ሌላስ በማለት ይጠይቁ ያሉትን ሁሉ ያክብቡት)**	ከማህፀንየደምመፍሰስ	1
		ሙሉሰውነትየማበጥ	2
		የእግርማበጥ	3
		የታችኛውሆድቁርጠት	4
		ትኩሳት	5
		ራስምታት	6
		ማነቀጥቀጥ	7
		ማላብ	8
		ሌላ(ይገለፅ) ----------	
312	በምን ቢወልዱ ይመርጣሉ?	በምጥ	1
		በኦፕሬሽን	2
313	በእርግዝናዎ ወቅት ስለ በኦፕሬሽን መውለድ ተወያይተው ያውቃሉ?	ኣላውቅም	0
		አዎ	1
መልስዎ ኣላውቅም ከሆነ ቁጥር 314ና315 ይዝለሉት			
314	ከማን ጋር ነበር የተወያዩት? **(ከአንድ በላይ መልስ ይቻላል ፤ ምርጫዎቹን በማንበብ ያስታውስዋቸው)**	ከጤናባለሞያጋር	1
		ከባለቤትዎጋር	2
		በኦፕሬሽን ከወለደች ሴት ጓደኛዎ ጋር	3
		በምጥ ከወለደች ሴትጓደኛዎ ጋር	4
		ከእናትዎጋር	5
		ሌላ (ይገለፅ) ----------	
315	በኦፕሬሽን ስለ መውለድ የተወያዩት መች ነበር?	በመጀመርዎቹ የእርግዝናዬ ሶስት ወራት	1
		ከ4-6 ባለው የእርግዝና ወራቶች	2
		6ትና ከዛ በላይ ባሉት የእርግዝና ወራቶች ግን ከምጥ በፊት	3
		በሁሉም የእርግዝና ወራቶች	4
		በምጥጊዜ	5
		ኣላውቀውም	88

316	በኦፐሬሽን ወልደው ያውቃሉ?	ኣላውቅም ኣዎ	0 1
316 መልስዎ ኣላውቅም ከሆነ 317 ይዝለሉት			
317	የትኛው ወሊድዎ ነበር ?	የመጀመርያ የሁለተኛ የሶስተኛ የኣራተኛ	1 2 3 4
በምጥ ለወለደች እናት ብቻ የሚጠየቅ			
318	በኦፐሬሽን መውለድ ኣስበው ያውቃሉ?	ኣላውቅም ኣዎ	0 1
319	በምጥ መውለድ የመረጡበት ምክንያት ምንድነው? **(ከኣንድ በላይ መልስ ሊኖር ይችላል ያሉትን ሁሉ ያክብቡ)**	ምጤፈጣንነበር ኦፐሬሽንስለምፈራ በኦፐሬሽን መውለድ የፈለግኩት ያህል ልጆች ለመውለድ የሚከለክለኝ ስለሚመስለኝ ምጤ ቀላል ነበር ጤነኛ ስለ ነበርኩ ሌላ(ይገለፅ) ----------	1 2 3 4 5
320	ለሌላ እርጉዝ ሴት በምጥ እንድት ወልድይመክራሉ?	ኣልመክርም ኣዎ ኣላውቅም	0 1 88
በኦፐሬሽን ለወለደች እናት ብቻ የሚጠየቅ			
321	በኦፐሬሽን የወለዱበት ምክንያት ምን ነበር? **(ከኣንድ በላይ መልስ ሊኖር ይችላል ያሉትን ሁሉ ያክብቡ)**	በምጥ ጊዜ በጣም ስለታመምኩኝ የልብ ችግር ስለነበረብኝ ሌላ የጤና ችግር ስለነበረብኝ በፊት በኦፐሬሽን ስለወለድኩኝ የምጥን ሕመም ስለፈራሁኝ በኦፐሬሽን መውለድ የሚያስከትለው ችግር ዝቅተኛ ስለሆን የህፃኑ ሁኔታ ኣደጋ ላይ ስለነበር የመውለጃ ቀኔ በጣም በማለፉ ሌላ(ይገለፅ) ---------- ኣላውቅም	1 2 3 4 5 6 7 8 88
322	ኦፐሬሽን ከማድረግዎ በፊት ምጥዎ ምን ያህል ቆይትዎበታል?	ምጥ ከመጀመሩ በፊት ነው ኦፐሬሽን የተደረግኩት ከሶሰት ሰዓት በታች ከ4-6ሰዓት ከ7-8ሰዓት	1 2 3 4

		ከ8 ሰዓት በላይ	5
		ኣላውቀውም	88
323	ለሌላ እርጉዝ ሴትበኦፐሬሽን እንድትወልድ ይመክራሉ?	ኣልመከርም	0
		ኣዎ	1
		ኣላውቅም	88
ለሁሉም እናቶች የሚጠየቅ			
324	ከዚህኛው ወሊድዎ በፊት መች ነበር የወለዱት?	የመጀመርያዬ ነው	1
		ኣመትኣይሞላውም	2
		ከ1-2ዓመት	3
		ከ2ትዓመትበላይ	4
የመጀመርያ ወሊድዎ ከሆነ 325ን ይዝለሉት			
325	ከዚህኛው ወሊድዎ በፊት የት ነበር የወለዱት?	የመንግስትሆስፒታል	1
		የግልሆሰስፒታል	2
		የመንግስትጤናጣብያ	3
		የግልክሊኒክ	4
		ሌላ(ይገለፅ) ----------	
326	ኣሁን ያልዎት ጠቅላላ የጤና ሁኔታ እንዴት ነው?	በጣምጤነኛነኝ	1
		ጤነኛነኝ	2
		ትንሽእያመመኝነው	3
		በጣምእያመመኝነው	4
327	የህፃኑ ኣሁን ያለው የጤና ሁኔታስ እንዴት ነው ?	በጣምጤነኛነው/ች	1
		ጤነኛነው/ች	2
		ትንሽእያመመው/ማትነው	3
		በጣምእያመመው/ማትነው	4
		ሌላ(ይገለፅ) ----------	
328	ለወደፊቱ የመውለድ ሃሳብ ካልዎት በምንቢወልዱ ይመርጣሉ ?	በምጥ	1
		በኦፐሬሽን	2
		መውለድኣላስብም	3
		ኣላውቀውም	88
ጠያቂው ከእናትየው ካርድ የሚሞላው			
329	**የ ህፃኑ መረጃ** ህፃኑ ሲወለድ ስንት ተመዘነ ?(በግራም)	ከ1500በታች	1
		ከ1500-2500	2
		ከ2501-3500	3
		ከ3501-4000	4
		ከ4000በላይ	5
330	የ እርግዝናዎ እድሜ ምን ያህል ነበር? (በሳምንት)	ከ28በታች	1
		ከ28-30	2
		ከ31-35	3
		ከ36-42	4

		ከ42በላይ	5
331	ህፃኑ ሲወለድ በምኑ ነበር የወጣው?	በጭንቅላቱ በእግሩ በጀርባው ሌላ(ይገለፅ)_____	1 2 3
332	የ ህፃኑ ፆታ ምንድነው?	ወንድ ሴት	1 2

በዚህ ጥናት በመሳተፍዎ በጣም አመሰግናለሁኝ **ያለቀበት ሰዓት፡**_____

Annex 5 :Dummy Table

1. Descriptive analysis

1.1.Scale variables

Variables	Mean	Min	Max	SD
1. Age(in years)				
2. Weight before pregnancy (in kg)				
3. Weight at term (in kg)				
4. Height (in cm)				

a. Categorical variables

i. Frequency and Percentage table for Demographic Information

Demographic Information			
Variables	**Frequency/Number**	**Percentage (%)**	**Crude /Adjusted OR [95% CI]**
1. Type of Hospital			
Brass 1			
Gandhi 2			
1. Marital status			
Never married 1			
Married 2			
Living together 3			
Divorced 4			
Separated 5			
Widowed 6			
2. Educational Level			
Illiterate 1			
Can read and write 2			
1-4th grade 3			

5-8th grade 4				
9-10th grade 5				
TEVT 6				
11-12th grade/ preparatory 7				
College education and above 8				

1.2.2. Frequency and Percentage Table for Socio-Economic Information

Socio-Economic			
Variable	**Frequency/Number**	**Percentage**	**Crude /Adjusted OR [95% CI]**
1. What is your Occupation			
Professional 1			
Clerical 2			
Sales and Services 3			
Skilled Manual labor 4			
Unskilled manual labor 5			
House Wife 6			
Other (Specify) _____			
No response 99			
2. What is your average monthly Income?			
Less than 600 ETB 1			
600-1000 ETB 2			
1001- 2000 ETB 3			
2001-3000 ETB 4			
3001-4000ETB 5			
4001-5000ETB 6			
More than5000ETB 7			
No response 99			
3. What is your husband/ partner's Occupation			
Professional 1			
Clerical 2			
Sales and Services 3			
Skilled Manual labor 4			
Unskilled manual labor 5			
House Wife 6			
Other (Specify) _____			
No response 99			
4. What is your husband/ partner's average monthly Income?			
Less than 600 ETB 1			
600-1000 ETB 2			
1001- 2000 ETB 3			
2001-3000 ETB 4			

3001-4000ETB 5			
4001-5000ETB 6			
More than5000ETB 7			
No response 99			
5. Who covers your medical bill when you give birth?			
I/ my husband cover my Medical bill 1			
My employer insurance cover my medical bill 2			
My husband's/ partner's insurance cover my medical bill 3			
Others(specify) _____			
No response 99			

1.2.3. Frequency and Percentage of Obstetric Information

Variables	**Frequency/Number**	**Percentage (%)**	**Crude /Adjusted OR [95% CI]**
1. Were you attending antenatal care during your last pregnancy?			
No 0			
Yes 1			
2. How many visits?			
Once 1			
Twice 2			
Three times 3			
Four Times 4			
More than 4 visit 5			
I don't know 88			
3. When was the first ANC follow up?			
In the first 3 months of pregnancy 1			
4-6 months of pregnancy 2			
After the 7th month of pregnancy 3			
I don't know			

88			
4. Where was the ANC follow up?			
In this hospital 1			
Other government hospital 2			
Other private hospital 3			
Public health center 4			
Private clini caesarean 5			
Other (specify)_____			
5. How many pregnancies do you ever have?			
One 1			
Two 2			
Three 3			
Four 4			
More than four 5			
No response 99			
6. How many deliveries do you ever have?			
One 1			
Two 2			
Three 3			
Four 4			
More than four 5			
No response 99			
7. Have you ever had an abortion or a miscarriage before?			
No 0			
Yes 1			
No response 99			
8. Did you ever have a still birth before?			
No 0			
Yes 1			
No response 99			
9. General health status during the last pregnancy			
Very healthy 1			
healthy 2			
sick 3			
very sick 4			
10. Health problem during last pregnancy			
No 0			
Yes 1			
11. What were the health problems?			
Vaginal Bleeding/Spotting 1			
Generalized Body Swelling 2			
Swelling of feet 3			

lower abdominal pain 4			
Fever 5			
Headache 6			
Chills 7			
sweating 8			
Other(specify) _____			
No response 99			
12. What is your ideal choice of mode of delivery?			
Vaginal 1			
Caesarean 2			
13. Have you ever discussed about caesarean delivery during your pregnancy?			
No 0			
Yes 1			
14. With who have you ever discussed about caesarean?			
Health care provider 1			
Husband 2			
Female friends with previous caesarean delivery 3			
Female friends with previous vaginal delivery 4			
Other (Specify)_____			
15. When did discussed With your Health care provider about caesarean delivery?			
During the first 3 months of pregnancy 1			
During the 4^{th}-6^{th} months of pregnancy 2			
After the 6^{th} month of pregnancy but before labor started 3			
Throughout my pregnancy 4			
During labor 5			
I don't know 88			
16. Did you have a caesarean delivery before?			
No 0			
Yes 1			
17. When was the previous caesarean delivery?			
1^{st} delivery 1			
2^{nd} delivery 2			
3^{rd} delivery 3			
4^{th} delivery 4			

18. Have you considered caesarean delivery?			
No 0			
Yes 1			
19. What makes you decide to choose vaginal delivery?			
Labor was fast 1			
I was afraid of operations 2			
caesarean may prevent me from having as much as children in the future 3			
Labor was easy 4			
I was healthy 5			
Other (specify)			
20. Would you recommend vaginal delivery for another pregnant woman?			
No 0			
Yes 1			
I don't know 88			
21. Why did you deliver by caesarean this time?			
I was very sick duringlabor 1			
I had a cardiac problem 2			
I had other health problems 3			
Previous caesarean delivery 4			
Fear of labor pain 5			
Caesarean have lower risk than Vaginal delivery 6			
The fetus was at Risk 7			
My due date of delivery was passed 8			
Other (Specify)_____			
I don't know 88			
22. How long have you labored before undergoing caesarean?			
The caesarean was given before labor started 1			
Less than 3hours 2			
4-6hours 3			
7-8hours 4			
Morethan8hours 5			
I don't know 88			
23. Would you recommend caesarean for another pregnant woman?			
No 0			
Yes 1			
I don't know 88			
24. When was your last delivery before the current delivery?			
This is my first delivery 1			
Less than one year 2			
1-2 year 3			

More than 2 year 4				
25. Where did you give birth in the previous deliveries?				
Government hospital 1				
Private hospital 2				
Public health centers 3				
Private clini caesarean 4				
Others(specify)_____				
26. How do you rate your general health status after giving birth?				
Very healthy 1				
Healthy 2				
Sick 3				
Very sick 4				
27. How do you rate the health status of your baby?				
Very healthy 1				
Healthy 2				
Sick 3				
Very sick 4				
Other (specify)_____				
28. If you have another child in the future, what would be your mode of delivery?				
Vaginal 1				
caesarean 2				
I have not plan for another child 3				
I don't know 88				
29. what was the birth weight of the new born ?(gram)				
<1500 1				
1500-2500 2				
2501-3500 3				
3501-4000 4				
> 4000 5				
30. How long the Gestational age of the fetus? (weeks)				
<28 1				
28-30 2				
31-35 3				
36-42 4				
42^{+} 5				
31. What was the Presentation of the fetus?				
Vertex 1				
Breech 2				
Transverse 3				
others (Specify)_____				
32. What is Sex of the new born?				
Male 1				
Female 2				